



# Food and Agriculture Organization of the United Nations

Meeting report

**FAO Regional meeting on food safety indicators in Asia and the Pacific –  
results of the pilot projects in Bhutan, China, Cook Islands and the Philippines**

13-14 November 2019, Wuhan, China



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## Abstract

Food safety can have a significant impact on public health and economic/trade implications and more importantly, it is a fundamental part of food security. However, the social and economic consequences of unsafe food are often invisible in many developing countries. This often leads the policy makers to consider the topic of food safety less of a priority and national budget allocation is not appropriately done.

There is already a set of food security indicators to capture various aspects of food insecurity. As part of the food security indicators, a set of nutrition indicators also exist to complete the picture of food security from the efforts towards the sustainable nutrition aligning with the Sustainable Development Goals (SDGs). Similarly, a Codex Alimentarius guideline, adopted in 2017 recommends that countries establish food safety indicators for each desired outcome for the effective national food control system.

Considering the global recommendations, in 2018-2019, four countries with different capacity levels, namely, Bhutan, China, Cook Islands, and the Philippines volunteered to pilot an initiative to develop food safety indicators, based on their countries' capacities and contexts. Key indicators specifically tailored to their specific situations were piloted in each one of the four countries, and upon completion of the projects, a regional meeting was held to share the results of the pilot projects; to discuss the experiences, challenges and lessons learnt on the development of food safety indicators; and to discuss a way forward for the initiative to be scaled up to make a regional guidance tool.

### **Keywords:**

Food safety, indicators, measure, Codex Alimentarius, Sustainable Development Goals, SDG, pilot projects, Asia and the Pacific, Bhutan, China, Cook Islands, Philippines, Food and Agriculture Organization of the United Nations, FAO



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## Abbreviations and acronyms

BAFRA	Bhutan Agriculture and Food Regulatory Authority
BFAR	Bureau of Fisheries and Aquatic Resources
CIFST	Chinese Institute of Food Science and Technology
FAO	Food and Agriculture Organization of the United Nations
FSANZ	Food Standards Australia New Zealand
NEWARS	National Early Warning Alert and Response System
NMIS	National Meat Inspection Service
SDG	Sustainable Development Goal

# 1 Introduction

## 1.1 Overview

Following the recommendation of the Committee on World Food Security, a set of food security indicators was developed to capture various aspects of food insecurity. As part of the food security indicators, a set of nutrition indicators have been also developed to complete the picture of food security from the efforts towards the sustainable nutrition aligning with the Sustainable Development Goals (SDGs). As those indicators have shown its usefulness in setting tangible goals and intensifying the limited resources to be allocated for key priority areas, various countries have initiated discussions on the potential effectiveness of having a set of food safety indicators as part of the food security indicators.

Upon receipt of several requests from its Members in the region, Food and Agriculture Organization of the United Nations (FAO) Regional Office for Asia and the Pacific conducted a technical review and developed a technical paper entitled “Measuring food safety: food safety indicators for Asia-Pacific”. Subsequently, the first regional consultation on the topic was organized in December 2017. At the consultation, regional experts confirmed the need and the importance of having food safety indicators that are both measurable and actionable: a pool of forty regional food safety indicators was developed to be used as a basis by national food safety competent authorities to develop their own ones. In 2018 and 2019, four countries in the region, namely Bhutan, China, Cook Islands and the Philippines have piloted some of the regional indicators to further set their own specific ones. The pilot project confirmed that regional indicators effectively cover a wide range of the different country situations and different capacity levels.

On 12-13 November 2019, the second regional consultation was held to discuss the progress of the pilot project, and to share the lessons learnt from the food safety authorities with other member countries in the region. The meeting was organized by FAO in collaboration with the Chinese Institute of Food Science and Technology (CIFST). Sessions were arranged during the large-scale conference entitled Food Summit China 2019 in Wuhan, China. A total of thirty-five participants from eleven countries, namely, Bhutan, Cook Islands, China, Lao PDR, Maldives, Nepal, the Philippines, Sri Lanka, Thailand, Tonga and Vietnam, attended the meeting. Participants mostly belonged to national food safety competent authorities; however, several researchers and professors also attended to the consultation. The list of participants is attached as Annex 1.

## 1.2 Objectives

The meeting aimed:

1. to review both the progress made by the pilot countries in the development and the implementation of the food safety indicators;
2. to share experiences, challenges and lessons learnt on the development of the food safety indicators in the region; and
3. to discuss a way forward on the food safety indicator initiative as a whole region, considering its significant relevance to the SDGs.

## 1.3 Regional pool of forty food safety indicators

The proposed set of regional food safety indicators (Annex 2) was distributed in both English and Chinese during the meeting. The same set was used to carry on the pilot projects in the four volunteering countries. The set still consists in the consolidation of the results of the first technical consultation, but both the pilot countries and the stakeholders who participated to the discussions agreed that the forty indicators

revealed to be extremely relevant to the various regional contexts in Asia and the Pacific. In particular, participants appreciated that some of the key indicators focus on having self-checking systems in the national food control systems, and they all agreed to keep this aspect as a central direction to move forwards with the initiative. Integrating such self-checking systems in to the overall national food control systems maintains the ideal food safety culture to grow into all the relevant sectors, including the government, food production/processing/service industry and the general public.

## 2 Opening session

Luo Yangbo, Vice President of CIFST officially opened the meeting and welcomed all the participants. Food safety is one of the biggest priorities in China, thus the opportunity for the country to participate in the FAO pilot project on food safety indicators was very well received by many key stakeholders in the country. In the last decade, China has made a significant progress in improving its national food control system; therefore, the possibility to measure their improvements was highly valued to make further considerations on both the regulators' and the general public's points of view. Yangbo stressed the importance of the partnership between the Government of China and FAO.

Masami Takeuchi, Food Safety Officer of FAO thanked the Government of China and CIFST for the fruitful collaboration on the project. In her opening presentation, she stressed the fact that there is no food security without food safety. She introduced a Codex Alimentarius guideline, entitled "Principles and guidelines for monitoring the performance of national food control systems", which was adopted in 2017, and she explained that the guidelines recommend Codex Alimentarius Members to establish food safety indicators for each desired outcome for the effective national food control systems. The first regional consultation produced a draft set of forty regional food safety indicators, and four countries piloted some those indicators at the national level. Many good results were obtained, and some key lessons learned could be shared. Takeuchi explained that based on the results of the pilot project, FAO will develop a regional guidance covering the practical examples obtained through the piloting countries.

## 3 Highlights of the meeting

### 3.1 Bhutan

Gyem Bidha, Deputy Chief Laboratory Officer, Bhutan Agriculture and Food Regulatory Authority (BAFRA) presented three out of the four indicators that were piloted in Bhutan:

1. Foodborne disease outbreak investigations (regional indicator number 24);
2. Food handlers' food safety knowledge (regional indicator number 30); and
3. Egg traceability (regional indicator number 34).

#### 3.1.1 An indicator that ensures the completeness of work

The Royal Center for Disease Control (RCDC), Ministry of Health, was tasked to test the foodborne disease outbreak investigations indicator, using the National Early Warning Alert and Response System (NEWARS). There have been a number of problems regarding the foodborne disease outbreak management in the past and establishment of NEWARS was to improve the system. First of all, Bhutan is experiencing a significant level of under-reporting of the incidents, mostly because people usually focus on the treatment and often do not prioritize to understand what food and what pathogen have caused their health problems. Furthermore, the investigation process often requires a close collaboration among different sectors, for example, health, agriculture, livestock, fisheries, plants, food industry, trade, local government, inspections, commerce and so forth, there has been a limited understanding of who should coordinate the outbreak investigation and how and what data should be shared with whom. In addition,

the outbreak investigation can be sometimes perceived as a format of a “study” to obtain the full scientific impacts and insights, thus taking a long time to conclude. Prior to the pilot project, even if some incidents were reported to NEWARS, the responses were not always possible to be coordinated in a timely manner, and only 26 percent of all the outbreaks reported to NEWARS was able to be investigated from 2010 to 2018. During the pilot project, everyone involved in the process was made well aware of what to do when a report comes up in the system. Thus during the ten month of the pilot project, all (100 percent) foodborne disease incidents/outbreaks reported to NEWARS were successfully investigated. During the pilot project, a trend analysis of foodborne disease outbreaks was also conducted for the reporting purpose, and it later contributed a great value in understanding the overall food safety situation in the country. It can be concluded that by setting a simple indicator to just show the completion ratio of the investigations, the immense impact was observed – the relevant officers became fully aware that a timely and thorough investigation needs to be conducted immediately after the NEWARS alert is received. The indicator can be wisely set for such priority actions to make sure that activities are completed.

### 3.1.2 An indicator that evaluates the effectiveness of a training

BAFRA regularly trains food handlers with a lecture followed by a written exam. Therefore for the food handlers’ food safety knowledge indicator, the level of knowledge acquired at the training and the level of knowledge retained after three months of the training were measured and compared to evaluate the effectiveness. Eight districts were selected from the country for the pilot project and the passing score of the exam has been set as 70. Immediately after the training, 94 percent of the trainees scored more than 70, but for the re-test, only 77 percent has passed the score 70. The result was a shocking surprise to BAFRA officers, making them realize some pitfalls existing in the system. Several possible elements that need to be re-considered were:

1. The standard exam might be too difficult;
2. Threshold of score 70 might be too high;
3. The training might not have been effective / consistent; and/or
4. There might be a different barrier (i.e., language, literacy level of the food handlers, etc.).

The Food handler’s license provided after availing the food handlers training has a validity of 5 years after which a refresher course was organized. However, the findings from this indicator measurement indicate that refresher course provided after five years to renew the license is possibly too long, and it can compromise food safety. Taking the results of this indicator, BAFRA recognized the need to make trainings more effective and consistent through the development of food handlers training modules for the food inspectors which is currently non-existent. Also revisiting the standard exam to focus on the essential items that have to be absolutely correct to handle food is being considered. Also, different language versions / less text versions of the exam can be considered for seasonal labors who come from neighboring countries.

### 3.1.3 An indicator that identifies a bottleneck of a system

BAFRA has been facing the issue of having a limited food traceability system available in the country. Due to the small size of the country, both in land and population, domestic food traceability has not been a big priority for the country, as the practice demonstrates that people usually know where their local food comes from and who produces it. Egg is a rare commodity that Bhutan is self-sufficient, and thus BAFRA decided to have this commodity as the pilot commodity to establish a simple traceability mechanism with proper documentation of the one-step back and one-step forward system. Ten districts have been selected to conduct the pilot, and the number of egg retailers implementing a basic traceability documentation system was measured. Out of ten retailers, seven retailers were able to keep the record

of unique farm codes assigned to the egg/poultry farms. None of them have retained to the habit of documentation after the pilot project. There was also an idea to mark the egg cartons and boxes with the unique farm codes for traceability, but it was realized later that those cartons and boxes are being re-used in many different points of retails, and putting the unique codes on them can cause confusion. One positive aspect was that all 10 retailers were able to maintain the records of their suppliers with complete information. This means trace-back activities may be do-able if they continue documenting as such. However, in Bhutan, there is no more middle points, meaning that the “forward” players are mostly consumers, thus there is no convincing element to emphasize the importance of keeping the document on one-step forward. After the pilot project, retailers reported that documentation was cumbersome, because it was mostly done with hand-writing. There is no capacity / labor to keep the record digitally.

Learning from the experience, BAFRA realized that the first food traceability system needs to be implemented where the risk is highly recognized. Also it was again realized that people do not yet appreciate the value of traceability for ensuring food safety. Advocacy and consumer education campaign might benefit such issues before putting the system to the food businesses so that consumers can drive the needs and importance in having the traceability in domestic food supply chains.

### 3.2 China

Clair Ding Hao, Assistant Researcher at the China National Center for Food Safety Risk Assessment explained that China piloted six indicators and among them, three indicators were presented:

1. the presence of an enabling national policy and a legal and regulatory framework that are consistent with international standards, guidelines and best practices (regional indicator number #4);
2. the number of outbreaks of foodborne illness reported on Salmonellosis and Listeriosis in humans (regional indicator number 26); and
3. the percentage of the population with access to potable water (regional indicator number 36).

#### 3.2.1 An indicator that ensures harmonization

First, the expert group asked whether the national food standard system is consistent with Codex Alimentarius standard system, in terms of the topics and categories, thus it was decided to compare them side-by-side. China Agricultural University led the process of counting the standards and guidelines. As of July 2019, 1 260 food safety standards have been published in China, which include more than 20 thousand numerical limits in pesticide and veterinary drug residues. The reference can be made to the database which is publicly available at <http://bz.cfsa.net.cn/db>. When compared with the Codex standard system, it was almost identical in categorical separations and the topics were in line with the topics that are dealt by Codex Alimentarius. See Table 1.

Table 1. Published food safety standards in China

Category	Number of standards
General standards	12
Food commodities	70
Nutrition and special dietary purpose	9
Food additives	591
Food supplements	40
Food contact materials	15
Food hygiene	29
Analytical method (chemical)	226

Analytical method (biological)	30
Analytical method (toxicological)	26
Analytical method for veterinary drugs residues	29
Analytical method for pesticide residues	114

During the process of measuring with the indicator, the role of risk assessment, the importance of the scientific researches and surveillance with concrete data were highlighted. Technical working group also commented that communication is key for all stakeholders, especially those who use the food safety standards. Also future directions were discussed, in terms of the efficacy of standard development and the usefulness in adopting international standards in Chinese scenario. Overall it was concluded that Chinese food safety national food standard system is in line with the Codex system.

3.2.2 An indicator to avoid

The number of foodborne disease outbreaks can be a tricky indicator to measure the status of food safety in any countries because of the impact of under-reporting cases. With the lead of Nanjing Agriculture University, China investigated the number of reported cases of food contamination with *Salmonella* and *Listeria*, and they compared the data obtained from this investigation with the number of reported cases of Salmonellosis and Listeriosis in human.

Figure 1. Percentage of contamination by *Salmonella* in meat (2009-2018)

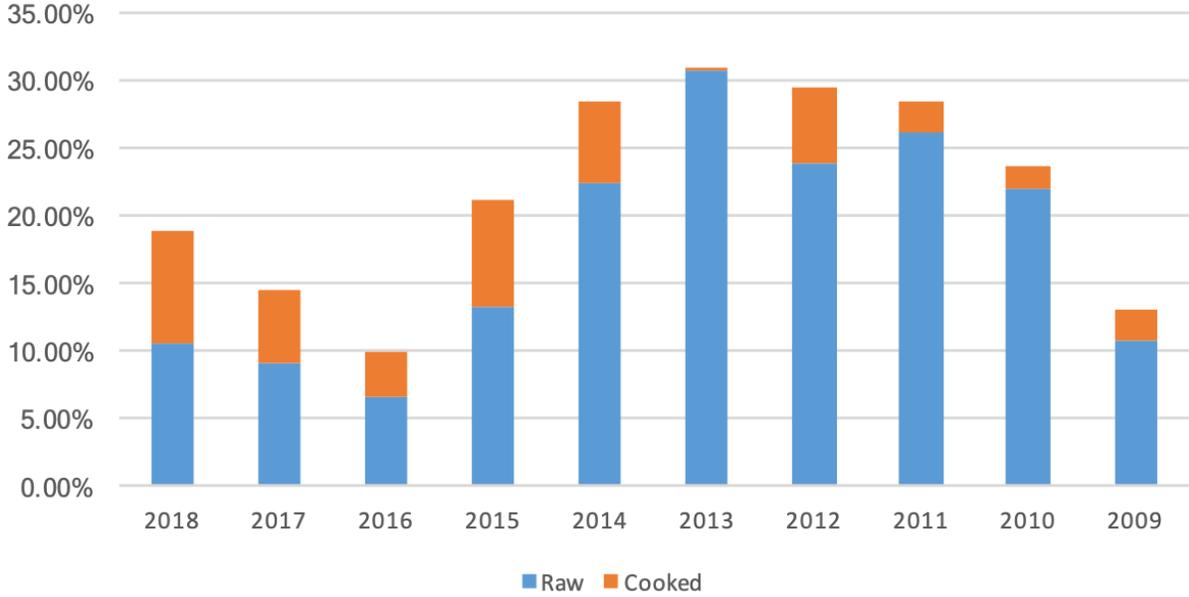
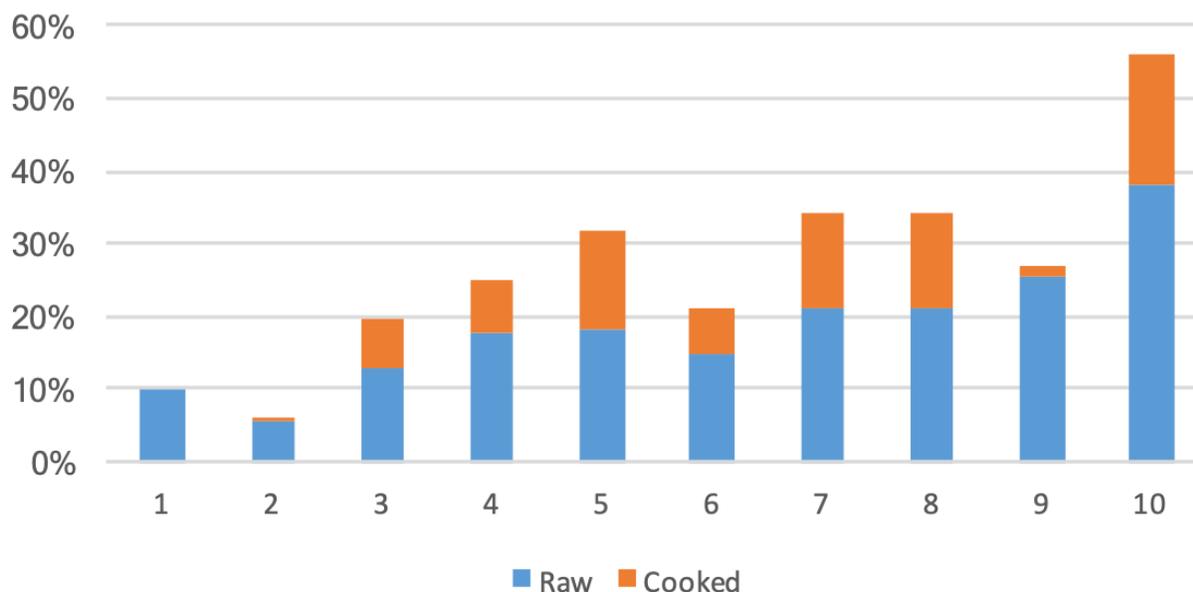


Figure 2. Percentage of contamination by *Listeria* in meat (2009-2018)



After comparing the data with the reports of disease outbreaks, the technical working group found that the two sets of data did not correspond. The team concluded that the gaps are representing the imbalance among different provinces and districts in China. Furthermore, changes in the number of disease outbreaks could be influenced by how timely the control measures were put into place. Overall, since multiple factors can affect this type of analysis, the Chinese case illustrated that it is not recommendable to use the number of diseases or on the number of food contaminations as an indicator. Countries could instead focus on approaches or processes related for example to the effectiveness in monitoring food contamination, or to the effectiveness in disease surveillance. These indicators could help achieve more results that are meaningful. The data also demonstrated that the approaches to control contamination in cooked meat is as important as those in raw meat. Therefore, food safety education for consumers, which is the last mile of the food safety chain, should not be underestimated.

### 3.2.3 An indicator that shows the trend and identifies the seriousness

Led by Zhejiang University, an indicator for the access to potable water was assessed in 1) the water supply and its composition; 2) the utilization of water; and 3) the quality of water supply. The results of the assessments are summarized in Tables 2 and 3.

Table 2. China's water supply and consumption from 2015 to 2017

	2015	2016	2017
Total water supply (100 million m <sup>3</sup> )	6 103.2	6 040.2	6 043.4
Surface water proportion	4 968	4 910.7	4 943.5
Groundwater proportion	1 068.1	1 057	1 015.3
Other than	67.1	72.5	84.6
Total water consumption(100 million m <sup>3</sup> )	6 103.2	6 040.2	6 043.4
Domestic water	793.5	821.6	838.1
Industrial water	1 334.8	1 308.0	1 277.0

Agricultural water	3 852.2	3 768	3 766.4
Eco-environmental water	122.7	142.6	161.9
Per capita water consumption (m <sup>3</sup> )	445	438	436

Table 3. Water quality of centralized drinking water in prefectural level cities or above in China

	Surface water compliance rate	Groundwater compliance rate
2015	92.6%	86.6%
2016	93.6%	85%
2017	93.7%	85.1%

Through the process, the technical working group concluded that the situation with water supply is not close to the ideal. Water sources come mainly from surface water, and then followed by ground water. Water is mainly use for Agriculture, but the use for such purposes is decreasing, in contrast with the use of domestic water, which is increasing. The quality of surface water has improved over the three years, but it still has not reached its optimal level. Due to the ongoing implementation of the water resource management programme, poorest water quality is in fact diminishing. The quality of centralized water supply at the level of prefecture cities or above is improving, but the quality of surface and ground water quality remained the same for the measured three years. The pilot underlined how serious the accessibility to water is in China and the related problems due to water quality and safety.

### 3.3 Cook Islands

Claytoncy Taurarii, Health Protection Compliance Officer, Ministry of Health, Cook Islands, explained that the country piloted six food safety indicators. Among them, three were presented.

1. the coverage of trained food handlers out of all licenses food handlers (regional indicator number 30);
2. the level of awareness on the competent food safety authority, through a survey (regional indicator number 1); and
3. the level of trust in the competent authority to manage food safety and the level of trust in safety of food in the country (regional indicator number 38).

#### 3.3.1 An indicator that finds alternate solutions for limited human resources

The Ministry of Health noted an increase in the number of food businesses in Rarotonga, the main island. The ratio to train food establishments was 1:25 per intake and the relevant trainings have been usually provided by health inspectors. Considering that a standard training session takes 4-8 weeks to cover all, the health inspector ratio is 1:300 and more. This indicates that the status of the monitoring system for food businesses and standard trainings have to be strengthened, and the number of trainers available needs to be increased. This also suggests that it may not be sustainable to task health inspectors to do all the trainings for food handlers, as a triple number of health inspectors would be needed to have these trainings sustainable. A discussion with the stakeholders suggested that a hand-in-hand training with stakeholders and the development of a standard post-evaluation could help addressing the situation.

#### 3.3.2 An indicator that promotes awareness

Consumers do not always know who to contact when they suspect a food safety issue. It is important that the consumers are fully aware that the Ministry of Health is leading and coordinating the activities relevant to food safety, in collaboration with other partner agencies and stakeholders. In order to assess the level of awareness in both Rarotonga (main island) and Pa Enea (outer islands), a survey was

administered. It revealed that 90 percent of the population in Rarotonga understood that Ministry of Health is the leading authority for food safety. In Pa Enua, however, 70 percent was unsure about it and about what other government agencies was the leading one in food safety. While a strong need of conducting a more effective public awareness campaigns was identified, during the pilot people were informed of the current structures of the national food control system in the Cook Islands. After the project, increased collaboration between community and Ministry of Health, increased collaboration with stakeholders, increased awareness on food safety, particularly in the Pa Enua, and with a positive surprise, an increased level of compliance from food establishments were observed.

### 3.3.3 An indicator that confirms the public trust

Ministry of Health investigated consumers' trust in the competent authorities to manage food safety, as well as their overall trust in safety of food in the country. The survey results showed that people highly trust in Ministry of Health in general, and that only a few people question about the safety of food in the country. Through the survey process, an increased level of trust from the community towards Ministry of Health was observed. Among the general public, there is a limited understanding that everyone is responsible for food safety, and there is a dependency observed on certain people when dealing with food safety. Continuous support needs to be provided from all the stakeholders to maintain the high level of trust in the community. Some respondents from the government agencies stated that trust needs to be established internally too, and that collaboration between the Ministry of Health and other governmental agencies or stakeholders, including food businesses, researchers and consumers, needs to be further strengthened. Building a high level of trust is a challenge to begin with, and it is true that losing it can happen overnight. Therefore, for the Cook Islands, it was good to have a confirmation that people trust the government, and it is extremely important to maintain the level of trust.

## 3.4 The Philippines

Enda Zenaida V. Villacorte, President of the Philippine College of Veterinary Public Health explained that the country piloted three indicators:

1. the number of meat inspectors trained on official food control doing routine inspection in licensed slaughterhouses in the National Capital Region (regional indicator number 14);
2. the presence of and access to International Organization for Standardization (ISO) 17025-accredited central food testing laboratory for Chloramphenicol drug residue test in shrimps for export (regional indicator number 18); and
3. the meat stakeholders, including consumers, are reached in meat safety information through printed materials and are aware of the potential problems and risks related to meat hygiene and safety (regional indicator number 31).

### 3.4.1 An indicator that sets the next target

For the first indicator, using data from 2016, the ratio of trained meat inspectors to licensed slaughterhouses was calculated as 2.42: 1. Using this as a baseline, the ratio was checked in July 2019 and it was improved to 2.88:1. This is possibly due to a successful increase in the number of deputized meat inspectors at the local government unit level. The ratio of meat control officers/licensed veterinarians to licensed slaughter houses was also improved from 0.42:1 (2016) to 0.76:1 (2019). The inspection/control works are still overwhelming, but considering the measured baselines, as well as the realistic increase in numbers after a small intervention, the technical working group was able to set the feasible targets for the next several years. In 3-5 years, the Philippines would like to achieve the ration of trained meat inspectors to licensed slaughterhouses to be at least 3:1. For the ratio of meat control officers to licensed slaughter houses, the target was set to be at least 1:1 (to be improved to have 2:1 in the longer term).

### 3.4.2 An indicator that communicates the success of a monitoring programme

For the issue of the drug residues in shrimps, the ratio of registered shrimp farms to farms access to Chloramphenicol residue testing was investigated from 2016 to July 2019 and such data was compared with the ones registered between 2004 and 2014. The Bureau of Fisheries and Aquatic Resources (BFAR) collaborated in this activity. During the period 2004-2014, 21 out of 74 shrimp samples tested positive to the residues in 2004, and 2 out of 85 samples tested positive in 2008. In the succeeding years, there were no positive detections. Having zero positive results indicates that the implementation of BFAR's national residue monitoring programme is effective. BFAR continues to disseminate information and to have dialogues with stakeholders, and these activities are possibly the reason for the successful results. On the topic of accessibility to the testing facility, from 2016 to 2017, the number of farms accessing the testing facility increased by 90 (36 percent); from 2017 to 2018, the number increased by 34 (10 percent); and from January-July 2019 it was 15 percent higher than that of the base year and more than 76 percent of the number of registered farms in 2018. Those increases in numbers for accessibility are beyond the initial expectations. The technical working group agreed that as long as accessibility and privacy are ensured, shrimp farms are willing to take the opportunity to have their products tested and analyzed. These results can be communicated widely to show that their products do not have the Chloramphenicol residue, and it would eventually engage consumers to trust the safety of those shrimps.

### 3.4.3 An indicator that suggests a change in methodology

For the meat hygiene indicator, the percentage of the number of meat industry stakeholders and consumers, aged 15 and above, who were reached by printed communication materials was calculated and compared with the data from 2016 with the one in July 2019. The National Meat Inspection Service (NMIS) collaborated to pilot this indicator. Printed materials were mostly brochures and posters. Estimating the population of the Philippines aged 15 and above as 70 733 800 in 2016, only 0.17 percent was actually reached through the printed communication materials on meat hygiene. In 2017, the number further decreased to 0.15 percent. In 2018, a slight increase was noted to 0.18 percent. Up to July 2019, a substantial decline was observed, as only 0.08 percent was reached. Despite the budgetary constraints, NMIS still produces many communication materials on meat safety and hygiene. Additionally, dedicated personnel would go to any length to promote his/her advocacy with or without budget. However, considering the large population size in all urban, suburban and rural areas in the Philippines, it is important that information is made available through many different channels and means, including social media, TV, radio broadcast and community papers. In particular, a more active use of social media can be further considered as it doesn't need a big budget, once long shelf life materials are developed for the purpose. Feedback from the local government units revealed that rural populations, especially wives and mothers, are very keen to receive information on food safety to protect their families. Also in this case, communication plays an important role in empowering consumers to make informed decisions and to follow good practices.

## 3.5 Values within the process

During the pilot project presentations, seven clear benefits were highlighted in developing food safety indicators, as they have shown to be useful to:

- 1) understand current situations;
- 2) monitor effectiveness and progress;
- 3) prioritize activities;
- 4) allocate proper resources;
- 5) identify gaps;
- 6) support evidence-based decision-making; and

7) develop effective communication and advocacy materials.

While visiting countries to assist the pilot projects, Masami Takeuchi, Food Safety Officer of FAO has identified three additional benefits within the project process:

- 1) the indicator development process requires inputs from various people, therefore several multi-sectoral and multi-disciplinary team were formulated;
- 2) the indicator development process made people realize what is missing even before measuring the indicator; and
- 3) the indicator development process made people focus on something that is measurable now, therefore project made people focus on feasible actions to improve the situation.

On these topics, Takeuchi developed a presentation that was subsequently presented by Yoenten Phuentshok, Junior Professional Officer of FAO, to stress that the development process of the pilot indicators has its own value.

### 3.5.1 The process helps (auto-) formulate multi-sectoral food safety teams

First, in the pilot project in the Philippines, the selection of the priority indicators was done through a consultation meeting with many different government agencies and stakeholders, including private sector and academia. As a result, 58 people from all the sectors actively participated in the meeting and all are made fully aware of how the indicators work in improving the situation. They also understood that various data from multiple data sources is needed to measure the target indicators. By the end of the consultation meeting, strong multi-sectoral and multidisciplinary teams were formed to work on respective indicators. As the nature of food safety is cross-cutting, this is a great benefit to have such teams to actively collaborate. Also, the goal of the indicator-setting was clear, as it was to simply measure the indicators to compare the results between the interventions. Therefore, it was easy for the technical working members to focus on the capacity development activities identified through the initiative.

### 3.5.2 The process helps identify concrete prerequisite activities



Imported products seized by BAFRA, Bhutan

Second, during the first stakeholder meeting in Bhutan, many people stated that an indicator for the safety of imported food needs to be prioritized, because the country is heavily dependent on imported food. Therefore, the topic was further looked in to understand what could be measured and what areas need to be focused. As of 2019, there has been an import ban on vegetable chili peppers in Bhutan due to the pesticide residue issue. More than 700 kilograms of imported products have been seized in one month in 2017 in the picture, and such activities have been taking significant time and efforts

of the BAFRA officials. A ban can be introduced for any political, economic or health reasons. Officers in BAFRA realized that first, a situation analysis of the country's imported food control needs to be conducted, and then the health risks should be prioritized to have an effective risk categorization based on the FAO manual (<http://www.fao.org/3/i5381e/I5381E.pdf>) with a good set of criteria. Then they can set a feasible and meaningful indicator to measure the effectiveness. For this reason, BAFRA dropped the possibility to have an indicator on imported food control but instead, they conducted the comprehensive national situation report on imported food control in Bhutan (<http://www.fao.org/3/ca8300en/ca8300en.pdf>), as a concrete prerequisite action.

### 3.5.3 The process helps focus on the reality

In Bhutan, while selecting the pilot indicators, stakeholders were interested in three unique indicators that were then included in the pool of the regional indicators:

- 1) the Presence of monitoring and verification mechanisms by the government on self-checking system for food business operators (regional indicator number 21);
- 2) a recognition system for the food business operators implementing good food safety practices (regional indicator number 22); and
- 3) the Presence of effective guidelines for developing good standard operating procedures (regional indicator number 23).

All three indicators above are on the self-checking system for food business operators, and the government officers stated that they were not aware of any established self-checking system in food businesses in the country, although there might be some. Therefore, meeting participants agreed to first promote the idea of self-checking for businesses. The effectiveness of self-checking depends on how the system is implemented. Learning from the experiences from Australia, Bhutan decided to introduce the idea of food safety culture in the country (<http://www.fao.org/3/ca7021en/ca7021en.pdf>) with a strong support from the high-level officials.

The hard reality is that it is not realistic to plan for the government to check everything, and for the inspectors to inspect every single food item in the country. If food safety culture is there, people who produce, transport, store, sell, process, serve and consume food will be well aware that food safety is everyone's responsibility. In particular, in food businesses, an established self-checking system is extremely valuable, and the inspectors/regulators can be their advisors rather than a police. Recognizing such long-term benefits, several food entrepreneurs formulated a "Food Innovation Group" which operates in cooperation with the government to develop key food safety messages for dissemination among food businesses. The ideas were put together in a promotion video available at: <https://youtu.be/E88Mnh0MVxE>.

In conclusion, there was a recognition that in some countries, the system is not ready to have a solid food safety indicator to start showing the results and progresses, but the process of development of the indicator still has the big opportunity. Food safety indicators can be used as one of many tools to improve national food control systems. Through the indicator setting process, it can bring people together, it helps realize the immediate needs, and it helps competent authorities to focus on actionable priorities.

## 4 Round-table session with regional experts

The learning points from each pilot country were discussed among seven regional experts, namely: Sivilay Naphayvong (Lao PDR), Sajidha Mohamed (Maldives), Pramod Koiralak (Nepal), Sudasing Pathirannehelage Buddhika Hemali Sudasinghe (Sri Lanka), Kanyarat Karnasuta (Thailand), Eleutilde C. Vainikolo (Tonga) and Man Ha Anh Nguyen (Viet Nam). Masami Takeuchi (FAO) facilitated the discussion that aimed at assessing the feasibility to develop national food safety indicators in their countries.

Experts from Viet Nam and Tonga stated that there would be a great benefit in having 40 concrete regional indicators that cover many food safety areas. In fact, in their countries, there are too many areas and topics in food safety, which need to be significantly improved, and the number of activities usually overwhelms officials. The opportunity to select three priority areas among the 40 food safety indicators seemed feasible in their country contexts. The expert from Tonga emphasized the importance of having the Cook Islands in the pilot project, as the contexts of the Pacific Island countries are very different from

those in Asia. The experiences and lessons learned from the Cook Islands were of a great value for countries like Tonga.

Experts from Lao PDR and Nepal did not hesitate and said that they would like to initiate the process of developing indicators, as it seems a feasible initiative in their countries. The scalability and flexibility that were presented in the pilot project results provided the assurance that the indicators can be applicable for any country contexts no matter what capacity levels they have. The expert in Nepal believe there are many commonalities with the Bhutanese situation, and he stated he would like to keep following the developments of the initiative there before starting with Nepal. Obtaining the high-level support in Nepal will be needed, as the government has just adopted the new constitution and country is going for federalism to promote decentralization of the authority. The experts from the Philippines commented that indicators do not necessarily require immediate high-level interventions. Clarification or adjustments in current work objectives and strategies to attain a more quantifiable and measurable result can be decided in the middle management level. High level decisions can then be sought if the above move would require a major shift or change in the set priorities. This way, food safety indicators can already be developed without delay. Other experts agreed to the comment while also agreeing to the fact that obtaining high-level support is extremely useful to move the initiative forward.

Thailand uses fixed categories to create projects and activities the food safety work, and they are similar to the 40 areas of regional food safety indicators. Therefore, Thailand would like to compare their areas with the 40 indicators to see if any gaps can be identified. The national food control system in Thailand is quite advanced, the facilitator commented, in comparison to many other developing countries. In some areas, there are good set of data which can be used as indicators to communicate with the general public to assure the safety of food in the country. Thailand is part of the Association of Southeast Asian Nations (ASEAN), and having standard indicators for ASEAN could be beneficial. The expert from Viet Nam agreed to this direction to have a discussion under the ASEAN umbrella.

The expert from Sri Lanka had an initial concern regarding the levels of capacities in her country to measure the parameters used in some of the pilot project. However, listening to the final presentation on the value in the process, she was convinced that establishing indicators could be valuable for her country as well. In particular, some quantifiable activities, such as laboratory analysis, can be the first ones to have an indicator, and understanding how much of the food items the country is covering for testing and analysis can be a useful starting point. The expert from Maldives stated that simple and low-level indicators, such as the water indicator in the Cook Islands, seems to be straightforward and Maldives would like to find a similar priority indicator to start measuring.

Upon the requests from the regional experts who would like to initiate the indicator project in their countries, four experts from the pilot countries, namely: Gyem Bidha (Bhutan), Claire Ding Hao (China), Claytoncy Taurarii (Cook Islands) and Pedro Dumaraos (Philippines) explained the flow of the pilot projects as:

1. the first stakeholder meeting: set the objectives and desired outcomes;
2. technical working group formulation: select prioritized indicators;
3. a series of group meetings: validate the feasibility and identify the data sources;
4. baseline measurement;
5. interventions / implementations of measures;
6. post-intervention measurement;
7. result analysis; and

8. follow-up stakeholder meeting: discuss the results, share the lessons learned and agree on the next steps.

As part of the conclusion of the discussion, regional experts commented that they realized that those 40 areas of the regional indicators are so important and thus need to be also captured in their food safety policy. This can be an added value of having the set of regional food safety indicators as a guide for food safety competent authorities in the region.

## 5 Next steps for the pilot countries

### 5.1 Bhutan

Priorities in Bhutan include a comprehensive food policy (well-constructed legislations and regulations should be put in place), more focus on the imported food controls (as the country depends on imports), the strengthening of testing and analysis capacities, and a nation-wide promotion of a Food Safety Culture. Bhutan will also consider if an indicator on water safety can be additionally established, the country will also make a revision on the current indicators to sustain them. In the coming years, Bhutan wishes to scale up the initiative to have other 40 areas to be covered.

### 5.2 China

Government authorities have come to clear realization that China have the capacity to establish various quantifiable indicators for all 40 areas. There are sufficient existing data and information to monitor the progress of various indicators covered by all 40 areas. Additionally, a set of food safety specific/independent laws might be useful in the context of China. China wishes to develop indicators to cover all 40 areas, and to complete the picture in the coming years with sub-indicators.

China has sufficient funding to carry out the indicator-related work, as the government (health and agriculture) are willing to collaborate with CIFST, which maintains a great network of various Universities and research institutes across the country. CIFST's researchers and professors have conducted data collection and analysis to contribute in development of and measurement of food safety indicators. Collaborations and partnerships are a good practice to use food safety indicators in the limited-resource situations of the government agencies.

### 5.3 Cook Islands

Priorities in Cook Islands are the serious expiry-date issues in the outer islands, the need of policy renewal to regulate priority areas of food safety, continuous efforts to ensure the safety of drinking water and the need in strengthening food safety testing and analysis capacity. As to the indicators, Cook Islands will continue monitoring the existing indicators for the next few years to review the progress, and will consider developing indicators in other priority areas to expand the project.

### 5.4 Philippines

Priorities in the Philippines include the assessment of public trust in the government to manage food safety through a better mechanism; the use of their own scientific data to ensure food safety for domestic consumption and exports; collaborations where roles and responsibilities are clearly defined among relevant agencies and the work is supported by a good policy. As to the indicators, the Philippines will integrate the existing indicators into the government agencies' regular work plans to permanently monitor the progress until the results become satisfactory.

## 6 Conclusions

Understanding the experiences of the pilot project and seeing the clear benefits, the participants at regional meeting agreed that an FAO regional guidance tool with a scalable set of indicators is needed. The guidance tool can show the scalable options for the indicators: for example, if the number of outbreaks is difficult to measure for a given country, the authority can decide to measure the number of food business operators having standard operating procedures that ensure good hygiene practices. Then, there would be a more realistic and measurable indicator. There are many ways and different angles to measure various areas of the food safety, and these depend on the status and capacity levels of the countries.

While the pilot has produced many good results and lessons learned, one prominent and eye-opening finding of the pilot project was that the food safety indicators would be fundamentally different from food security and nutrition indicators in terms of the objectives of the measurements. All pilot countries have shown their strong reservations to be compared with other countries using food safety indicators; as such, comparison would have a direct impact on food trade. This confirms that the food safety indicators should not be used as a benchmarking tool among countries, unless they are carefully constructed and worded.

Also all pilot countries have realized that a key value of the project stands within the process of developing and measuring the indicators. In particular, the act of quantifying something that was never measured before provided a brand-new point of view and created a clearer path to make the functions effective. This implies that the indicators can be extremely useful in the visualization/clarification of the potential issues and they would serve as a pathfinder to develop a strategic roadmap for a result-based food safety programme.

Countries have concluded that the initiative would significantly contribute to the SDG 2 “End hunger, achieve food security and improved nutrition and promote sustainable agriculture” and SDG 3 “Ensure healthy lives and promote well-being for all at all age”. The regional set of food safety areas on which to develop indicators is a useful map on the essentials in food safety management. Each area has also scalable options to develop or tailor national food safety indicators. This means that a set of investment packages to improve food safety could be developed based on the 40 food safety indicator areas, and these packages can be easily communicated to and implemented by various partners working with SDG development and who might not necessarily be food safety experts. Once the guidance tool and the package are designed and published, a significant level of efficiency can be expected, as the implementation itself does not require food safety experts and the process of indicator development/measurement would provide countries with visible results.

The food safety indicators can be a part of the framework of food security indicators. Once all the pilot projects are finalized, a regional guidance tool will be made available for countries in the region to apply the methodologies and approaches used in the pilot countries. As the initiative was successful in all four pilot countries with different capacity levels, the tool will most likely be applicable in any country in the region and possibly in other regions. As the topic of food safety is crosscutting, and as such, it involves food, plant, livestock, fisheries, forestry, health and environment, concrete partnerships can be sought with other relevant United Nations partner agencies to apply the initiative more widely. As a global leader in the area of food safety, FAO needs to further scale up the initiative to extrapolate the key points that could be used as a global tool. Then, many countries will benefit from the innovative initiative.

## Annex 1. List of participants

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## Annex 2. Proposed set of regional food safety indicators

A guide for countries to select effective indicators and tailor them for the national context

Note: This is a simple consolidation of the indicators selected by 9 working groups. This is not a final version and it requires more work on appropriate wordings.

### **Food safety competent authority(-ies) and partners**

1. Presence of a leading food safety agency (entity) to drive the coordination work to ensure food safety
2. Food safety relevant agencies have clearly defined roles and responsibilities for food control management
3. Competent authority is supported by necessary infrastructure and adequate resources (e.g., human and financial resources and lab equipment and materials)

### **Policy and legal & regulatory framework**

4. Presence of enabling national policy and legal & regulatory framework are consistent with international standards, guidelines and best practices (including legally embedded criteria for executing food recall and traceability) and they show government commitment to protect public health and ensure fair practices in food trade

### **Principles of the national food control systems**

5. National food control system covers the entire food chain (farm-to-table) in an integrated system
6. National food control system is implemented in a transparent manner with mechanisms for information, education, communication and coordination with relevant stakeholders
7. Use of risk analysis paradigm by the competent authority to inform and support risk-based, science-based and evidence-based decision-making and establish food safety control measures with a mechanism for expert consultation to advice government on food safety risk assessment

### **Codex and functions with other international bodies and platforms**

8. Existence of National Codex Committee with allocated budget
9. Level of engagement in the work of Codex
10. Ability to meet and demonstrate compliance with international food safety and quality requirements and obligations (e.g., Codex standards, WTO SPS Agreement and requirements of trade partners)
11. Credible functioning of national contact points for Codex, OIE, IPPC and other relevant international organizations and platforms (e.g., INFOSAN) with required resources

### **Food inspection**

12. Criteria for risk categorization and prioritization established for food inspection
13. Presence of functioning risk-based food inspection mechanism with well-defined SOPs
14. Number of food inspectors (per population) trained on official food control
15. Number of inspections being conducted for infrastructure, installations and hygiene throughout farm to fork food chain (primary production, processing, distribution, hotels and restaurants and community kitchens)

### **Food safety certification**

16. Presence of functioning food safety certification systems with well-defined SOPs

### **Testing and analysis**

17. Presence of and access to capable diagnostic and analytical laboratories with well-defined SOPs
18. Presence of and access to accredited food testing laboratories with well-defined SOPs

### **Notifications**

19. Presence of notification mechanism on food safety incidents and outbreaks
20. Presence of notification mechanism on food recalls

### **Support to self-checking systems**

21. Presence of monitoring and verification mechanisms by the government on self-checking system of the producers, processors, food industries and food business operators throughout the food chain
22. A recognition system for the producers, processors, food industries and food business operators implementing good food safety practices
23. Presence of effective guidelines for developing good standard operating procedures (SOPs) and instructions concerning GAP, GMP, GHP and HACCP

### **Food monitoring, health surveillance and epidemiology**

24. Mechanisms are established and functioning for detecting to foodborne disease and food contaminations
25. Existence of One-Health disease surveillance systems (animal plant, human and environmental health)
26. Number of outbreaks of foodborne illness reported
  - a. Salmonellosis in humans
  - b. Listeriosis in humans
27. Percentage of reported occurrences in which presence/contamination of hazards are identified (biological, chemical, physical) in all types of food and feed from farm to fork [or, Percentage of commodities (food or animal feed) that comply with regulations (e.g., MRLs), pertaining to pesticides, pesticide residues, veterinary drug residues, food additives, mycotoxins, heavy metals, radiological substances and key chemical, microbiological and physical (non-food) contaminants]
  - c. *Salmonella* spp. in food (specify a commodity for an indicator)
  - d. *E. coli* in food (specify a commodity for an indicator)
  - e. *Listeria monocytogenes* in food (specify a commodity for an indicator)

### **Data collection, collation and interpretation**

28. Institution(s) exists that is responsible for the collection, collation and interpretation of data on food safety issues (including microbiological, chemical, natural and environmental) at the national level

### **Food safety emergency preparedness**

29. National food safety emergency response capacity supported by a national plan/guidelines/rapid alert system, which state responsibilities, relevant parties and necessary systems and actions including traceability and food recalls

**Information, education, communication and trainings**

30. Risk-based education and trainings to food business operators related to hygiene and food safety are mandated and provided
31. All stakeholders farm to fork, including consumers, are reached in food safety information activities and are aware of the potential problems and risks related to hygiene and food safety

**Shared responsibility - industry, producers, processors, food business operators**

32. Percentage of producers, traders and food business operators implementing documented self-checking food safety management system, such as good standard operating procedures (SOPs) on GAP, GMP, GHP, HACCP or any others in accordance with the local context
33. Percentage of food establishments from farm to fork displaying information, education and communication materials or signs on hygiene and food safety within their premises
34. Percentage of producers, processors, traders and food business operators that have implemented a functioning traceability system
35. Percentage of food establishments complying to labelling requirements including allergen risk indications

**Access to potable water**

36. Percentage of the population with access to potable water

**Public trust in food safety**

37. Presence of mechanism to understand public perception on the national food control system
38. Levels of public trust in food safety

**Food and feed trade**

39. Percentage of reported rejections of food exports due to food safety by importing countries
40. Mutual recognition of equivalence systems (e.g., MRA, MoUs for market access) based on international guidelines

## Annex 3. Workshop agenda

### Day 1: 12 November 2019

Time	Item	Note
08.00 – 09.00	Registration	
09.00 – 09.30	Opening and round of introduction	CIFST
09.30 – 09.45	Meeting overview and objectives	Masami Takeuchi (FAO)
09.45 – 10.00	Tea/coffee break, photo session	
10.00 – 10.30	Introduction to the FAO's initiative on food safety indicators in Asia and the Pacific	Masami Takeuchi (FAO)
10.30 – 11.00	Pilot project in Bhutan, progress and experiences	Gyem Bidha (Bhutan)
11.00 – 11.15	Q&As	
11.15 – 11.45	Pilot project in Cook Islands, progress and experiences	Claytoncy Taurarii (Cook Islands)
11.45 – 12.00	Q&As	
12.00 – 13.00	Lunch	
13.00 – 13.30	Pilot project in the Philippines, progress and experiences	Edna Zenaida Velarde Villacorte (Philippines)
13.30 – 13.45	Q&As	
13.45 – 14.15	Pilot project in China, progress and experiences	Claire Ding Hao (China)
14.15 – 14.30	Q&As	
14.30 – 15.00	Value within the process	Yoenten Phuentshok (FAO) and Gyem Bidha (Bhutan)
15.00 – 15.15	Q&As	
15.15 – 15.30	Tea/coffee break	
15.30 – 16.00	Review of 40 regional food safety indicators	Masami Takeuchi (FAO)
16.00 – 16.45	Structured discussions	Facilitated by Masami Takeuchi (FAO)

### Day 2: 13 November 2019

Time	Item	Note
Morning	Plenary session of the Food Summit in China 2019	All are invited
	Lunch	
14.00 – 14.15	Recap of the Day 1	
14.15 – 15.30	Food safety situations and possible usefulness of establishing food safety indicators: <ul style="list-style-type: none"> <li>- Sivilay Naphayvong (Lao PDR)</li> <li>- Sajidha Mohamed (Maldives)</li> <li>- Pramod Koiralak (Nepal)</li> <li>- Sudasing Pathirannehelage Buddhika Hemali Sudasinghe (Sri Lanka)</li> <li>- Kanyarat Karnasuta (Thailand)</li> <li>- Eleutilde C. Vainikolo (Tonga)</li> <li>- Man Ha Anh Nguyen (Viet Nam)</li> </ul>	Round table session
15.30 – 15.45	Tea/coffee break	
15.45 – 16.15	Structured discussion on the benefits of food safety indicators and their relevance to SDGs	Facilitated by Masami Takeuchi (FAO)
16.15 – 16.45	General discussions	Facilitated by Claire Ding Hao (China) and Masami Takeuchi (FAO)
16.45 – 17.00	Closing and a way forward	FAO
17.00 – 17.30	Networking of regional participants and FAO	

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